

## REMARKS

### I. SUPPORTING DISCLOSURES FOR THE NEW CLAIMS

New method claims 19 to 37 have been filed and the original claims 1 to 18 have been canceled.

New method claims 19 to 37 contain the subject matter of the issued claims of Canadian National Stage Patent 2 554 641 based on PCT/EP 2005/001311. The above-identified U.S. Patent Application is the U.S. national stage of that PCT application.

The new method claims cover a method of determining one or more areas to be inspected on a surface of a three-dimensional object. The sole new independent claim 19 contains the combined subject matter of canceled claims 11 and 12. Of course the method is expected to be implemented with an arithmetic logic unit (processor or computer) and that limitation has been added to the independent claim 19. The basis for this added limitation appears in the second full paragraph on page 10 of the applicants' originally filed U.S. specification.

The CAD data of the new dependent claim 20 is mentioned in canceled claim 11.

The features and limitations recited in new dependent claims 21 to 26 are substantially the same as those of canceled claims 13 to 18 respectively.

Although no independent claim for a method of planning an inspection path has been filed, the features and limitations of canceled method claims 1 to 10 appear in dependent method claims 27 to 37. The subject matter of canceled method claim 10 was divided between claims 36 and 37 to avoid a possible indefiniteness rejection.

## **II. Obviousness Rejections of the Method Claims**

### **A. Rankin II in view of Claridge**

Claims 11 to 12 and 14 were rejected as **obvious** under 35 U.S.C. § 103 (a) over Rankin II, et al, in view of WO 87/00629, Claridge

#### **1. Content of the Cited Prior Art**

Rankin II discloses a method of planning an inspection path of a picture-taking device (3D camera) for inspecting an object based on an electronic model of the object to be inspected and a model of the 3D camera comprising different device parameters. In this method an electronic model of the camera for capturing a three-dimensional image

of the object and a CAD model of the object are input into a processor (arithmetic and logic unit), which determines a set of viewing positions and orientations of the 3D camera that are necessary for an inspection of the object. The calculated positions and orientations of the camera are ranked according to visibility criteria (see abstract, paragraphs [0006] to [0010], claim 1).

The method of Rankin II is embodied in a preferred embodiment described in paragraphs [0019 to [0024]. A flow chart of this method appears in fig. 2.

Page 8, lines 5 to 8, of the Office Action **admit** that “Rankin fails to disclose wherein it is specified for certain areas (12, 13) of the object whether and in which manner these areas (12,13 are to be inspected” and that, during the inspection with a picture-taking device (4) these areas (12) to be inspected are assigned to the pictures that were actually taken”. These features are exactly the subject matter of steps a to c of the applicants’ new independent method claim 19.

Furthermore Claridge does not disclose or suggest the subject matter of steps a to c of applicants’ new independent method claim 19. Independent claim 1 of Claridge claims an apparatus for inspecting a complex shaped painted surface comprising means for producing a

beam of radiation, means for directing the beam at the surface to be inspected, means for scanning the beam across the surface, means for moving the material on which the surface is located and means for receiving the reflected beam from the surface.

No mention is made in the claims of Claridge regarding determination of some areas to be scanned and other areas that are not to be scanned.

Dependent claim 11 claims embodiments including means for analyzing the results of scanning the entire surface with the scanning beam that distinguishes between real defects and apparent defects.

Independent claim 13 of Claridge includes the features of claim 11 and the features of claim 1. Dependent claims 14 to 20 define various characteristics of the reflected beam that is obtained from scanning the entire surface, such as intensity and frequency changes, that are used to distinguish a real defect in a painted surface from an apparent defect during the scanning of the entire surface of the object

The circuitry used to distinguish defect types so as to be able to identify locations on the surface that were not properly painted or defects in the painted surface is described in the detailed description of

Claridge under the heading “General Arrangement of Electronic Processing”. The circuits 70, 76 etc are used to distinguish various defects during the scanning of the entire surface.

However Claridge does not disclose or suggest **excluding** any portion or area of the surface of the object from scanning or inspection prior to scanning or a method of selecting areas to be scanned and other areas not to be scanned. There is no suggestion of those features of the applicants’ claimed method in the Claridge reference.

Furthermore the Office Action does not cite any portion of the Claridge WO reference, which discloses or directly suggests the features of steps a, b and c of the applicants’ new claim 19.

The Office Action merely states that Claridge states a problem with electronic scanning methods that were used to find defects in painted surfaces, namely that during the prior art electronic scanning of a complex painted surface some features of the complex surface that are due to parts that are not supposed to be painted, like moldings, can appear to be defects in the painted surface in the scanning results. Claridge does **not** solve this problem by a method including steps a, b, and c of the applicants’ new claim 19, but instead by a different method.

The issue of whether or not the statement of the problem in Claridge is enough to suggest the applicants' claimed method is considered further herein below under the heading "Rationale".

## **2. The Differences between the Prior Art and the Claimed Invention according to new Method Claim 19**

Rankin II does not disclose or suggest the features of steps a to c of the new independent method claim 19, as explained above. Rankin II does not describe a method for automatically determining parts or areas of a surface that are to be inspected and also other parts or areas of a surface that are not to be inspected with a processor based on e.g. CAD design data in electronic form, as claimed in applicants' claim 19.

Also Claridge does not disclose or suggest a **method** comprising automatic determination of areas on the surface of a three dimensional body to be inspected, automatic determination of other areas not to be inspected, and determination of the respective manner in which the areas to be inspected are automatically inspected -- by a processor based on electronically stored CAD data relating to the object.

In contrast, the apparatus of Claridge does include means for inspecting an entire painted surface of a three-dimensional object, but

no means is provided for an advance automatic determination of the areas on the object that are not to be inspected or scanned so as to minimize inspection effort. The **eighth full paragraph of the written description of Claridge** clearly states that an object of their invention is to scan the "whole surface", i.e. the entire surface, not merely certain areas of the surface.

Claridge only describes a method in which the surface of an object is fully inspected. The disclosures of Claridge suggest that in a different method of inspection after producing pictures of the whole surface, electronic inspection means distinguishes between genuine defects (paint defects, scratches, dents) and "features" in the pictures already taken, which are not defects, such as a window pillar or molding strip, because the scanning method of Claridge inspects the entire surface. For example, fig. 12 of Claridge depicts that the signals of scanning head 62 are processed by units 70, 71, 72 and 73 in order to determine whether these signals comprise a particular kind of defect. Only then the local processor identifies whether the apparent defect signal is from a genuine defect or from a feature like a molding strip, which need not be scanned or identified.

This means that Claridge does **not** suggest that path planning for the camera or sensor is influenced by different area types on the

surface, i.e. those to be inspected and those that are not to be inspected, because Claridge teaches that the entire or whole surface is inspected.

### **3. Rationale for the Obviousness Rejection**

According to the first sentence of the paragraph bridging pages 8 and 9 of the Office Action it would have been obvious to one of ordinary skill in the art to modify the method of Rankin II by providing specified areas to be inspected or [other areas] not to be inspected on a complex painted surface and then path planning [sic] by reducing coverage to areas not to be inspected and assigning areas to be inspected to pictures actually taken during an inspection in order to refine inspected areas to avoid a false alarm due to apparent defects that are not real defects in the painted surface.

The basis for this opinion is apparently expressed in the following sentences of the aforesaid paragraph in the Office Action which state that Claridge discloses that a complex painted surface may have parts that amount to false defects, such as a molding. That statement is true of course, but it is respectfully submitted that it does not provide a sufficient basis for concluding that the subject matter of claim 19 is *prima facie* obvious from the combined disclosures of Rankin II and



Claridge. **That statement amounts to the expression of a problem** that exists in the methods of inspecting such complex painted surfaces for defects, but it does not suggest the applicants' solution according to claim 19 that addresses the stated problem. Claridge solves that problem in a different manner, which is less efficient than the applicants' claimed method, which involves inspecting the entire or whole surface and then distinguishing between real defects and false but apparent defects.

Claridge as explained above does not disclose determining areas to be inspected and determining other areas not to be inspected incorporating utilizing CAD data that models the object with the surface to be inspected. Claridge does not actually disclose assigning areas to be inspected to pictures that are actually taken during an inspection.

Claridge merely states a problem as explained above and does not teach or suggest the applicants' solution of the problem, as claimed in claim 19. This is equivalent to an "obvious-to-try" rationale, because it is equivalent to arguing that it would be obvious to try the applicants' solution to the problem posed by Claridge, despite the fact that Claridge solves the problem by a different method than the method according to applicants' independent method claim 19.

In fact the teaching of the different method of Claridge would lead one skilled in the art away from applicants' method for solving this problem, not to it. M.P.E.P. § 2145 X.

The "obvious-to-try" rationale has recently been rehabilitated by the *KSR* Supreme Court decision (M.P.E.P. 2143). However some obvious-to-try arguments are valid, namely those that involve a limited number of known choices and some guidance in the prior art reference on which it is based that would lead one skilled in the art to the particular claimed method.

According to the Federal Circuit Court of Appeals after the issuance of the *KSR* Supreme Court decision:

**"Obvious to Try is a valid rationale under *KSR* that establishes a case of prima facie obviousness when the inventor's solution to the prior art problem is selected from a "finite (meaning limited) number of identified (i.e. identified in the prior art), predictable (with a reasonable expectation of success given the level of technology in the particular art in question)."**

***Takeda Chem. Indus. V. Alphapharm Pty., Ltd.***, 492 F.3<sup>rd</sup> 1350, 1356 (Fed. Cir. 2007). A similar case with the same conclusion that follows ***Takeda : Eisai v. Dr. Reddy's Lab, and Teva Pharmaceuticals***, 2007-1397, 1398 (Fed. Cir. July 21, 2008).

There are conceivably many (an undetermined number) different methods to solve this particular problem besides the method selected by Claridge. There is nothing in Claridge that would lead one to believe that there is a reasonable expectation of success for the applicants' method claimed in claim 19.

Furthermore currently no guidance is present in Claridge that would clearly lead one to the applicants' particular **solution** of the problem posed in Claridge as claimed in claim 19. In addition, the combined disclosures of Claridge and Rankin II do not enable one skilled in the art to make and/or use the applicants' claimed method.

Accordingly applicants' claim 19 is not *prima facie* obvious from the combination of Rankin II and Claridge.

For the aforesaid reasons it is respectfully submitted that none of the new claims 19 to 37 should be rejected as obvious under 35 U.S.C. § 103 (a) over Rankin II, et al, in view of WO 87/00629, Claridge.

**B. Rankin II in view of Claridge and further in view of Albeck, et al**

Claims 13 and 15 were rejected as obvious under 35 U.S.C. § 103 (a) over Rankin II, et al, in view of WO 87/00629, Claridge, and further in view of U.S. Patent 6,167,151, Albeck, et al.

Claims 13 and 15 have been canceled, but new claims 21 and 23 include the features and limitations of claims 13 and 15.

Albeck discloses a system for reconstruction of a three-dimensional object to arbitrary precision. The system has an optic head, a mechanical manipulator for the optical head to orient and position it, and the 3D reconstruction unit. A preferred embodiment of the system includes an optional unit containing CAD design data of the object for comparison. The system can also include a path planning unit for the optic head. See the block diagram in fig. 1 of Albeck.

The system can be used in a method of inspection of the object according to Albeck.

The **Office Action** on **page 10 states** that “Albeck specifically discloses wherein the areas to be inspected are stored and/or

visualized as calculated pictures in order to show the inspection path around the object” and cites column 9, lines 59 to 66 to support that statement. The wording “superimpose the inspection path on the CAD model” is also mentioned at that point in the Office Action.

This reasoning is inapplicable to the new claims 21 and 23 because claims 21 and 23 and the main claim 19 on which they depend have nothing to do with the inspection path for the camera or the representation of the inspection path. Claim 19 only claims a method comprising an automatic determination of the areas to be inspected and other areas not to be inspected and the assignment of the areas to pictures of the object already taken.

Furthermore the disclosure in column 9, lines 59 to 66, does **not** state that the CAD model is used to determine other areas or portions of the object that are not to be inspected, as claimed in applicants’ claim 19. The wording “overlapping adjacent object portions” in Albeck suggests that pictures are exhaustively taken of the entire object to the extent that the images or pictures overlap each other, not that some areas or portions of the object are not imaged.

Thus Albeck like Claridge contains no disclosures or suggestions of the main features of the new claim 19, namely automatically

determining areas to be inspected and automatically determining other areas not to be inspected with an arithmetic and logic unit (processor) based on the input of CAD data that models the object with the surface to be inspected – prior to actually generating the images or pictures of the object. Then the areas to be inspected are assigned to parts of the pictures actually taken of the surface to be inspected.

Regarding applicants' claim 23 on page 11 of the Office Action it is admitted that Albeck does not specifically disclose visualization or superimposition of the areas to be inspected in the pictures that were actually taken as claimed by claim 23.

Furthermore a mere allegation or opinion that a feature of a claimed method is obvious is insufficient to establish a case of *prima facie* obviousness according to U. S. Procedural Rules for examination of claims. M.P.E.P. 706.02 (j) states that the obviousness statute requires that the examiner should set forth in the Office action:

- (A) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate,
- (B) the difference or differences in the claim over the applied reference(s),

(C) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and  
(D) an explanation >as to< why >the claimed invention would have been obvious to< one of ordinary skill in the art at the time the invention was made\*\*.

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Referencing a decision of BPAI:

**"To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." Ex parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). \*\***

It is respectfully submitted that Albeck does not provide a sufficient basis for a case of *prima facie* obviousness of the combined features of new claim 19 and claim 21 or 23.

For the aforesaid reasons and because of the changes in the claim wording it is respectfully submitted that **none** of the new claims 19 to 37, especially claims 21 and 23, should be rejected as obvious under 35 U.S.C. § 103 (a) over Rankin II, et al, in view of Claridge and U.S. Patent 6,167,151, Albeck, et al.

**C. Rankin II in view of Claridge and further in view of Gupta, et al**

Claim 16 was rejected as obvious under 35 U.S.C. § 103 (a) over Rankin II, et al, in view of U.S. Patent 5,715,167 (Gupta).

New claim 24 contains the subject matter of claim 16, but depends on claim 19, which contains a combination of subject matter from canceled claims 11 and 12.

Gupta does disclose a system for accurately positioning a manufactured part in a calibrated position in a fixture by comparing a three-dimensional image of the actual fixture obtained by X-ray imaging with CAD design data showing the manufactured part in the correct position in the figure. The CAD data in the computer is then compared with the X-ray imaging data (column 2, lines 18 to 25, of Gupta). The part may be repositioned as a result of the comparison (column 1, lines 38 to 58, of Gupta).

However Gupta does not supply any suggestions or disclosure regarding methods of inspecting a surface of an object. Specifically Gupta does not disclose or suggest the features of claim 19 or the features that are lacking from the combined subject matter of Rankin II



and Claridge that are necessary to arrive at the method claimed in applicants' main method claim 19.

Particularly Gupta does not disclose or suggest a method comprising automatically determining at least one area on said surface of said three-dimensional object to be inspected and at least one other area that is not to be inspected with an arithmetic logic unit based on design data in the electronic form related to the three-dimensional object. Also Gupta does not disclose or suggest performing an inspection by first taking pictures of the three-dimensional object and then assigning areas to be inspected to parts of the pictures.

Hence the rejection based on Rankin II and Gupta with or without Claridge is no longer applicable to claim 24, which includes the combined subject matter of claims 23, 22, and 19 because it depends on those claims and thus includes the subject matter of the above paragraph.

For the aforesaid reasons it is respectfully submitted that new claim 24 should not be rejected as obvious under 35 U.S.C. § 103 (a) over Rankin II, et al, in view of WO 87/00629, Claridge, and further in view of U.S. Patent 5,715,167 (Gupta).

**D. Rankin II in view of Claridge and further in view of Pryor**

Claim 17 and 18 were rejected as obvious under 35 U.S.C. § 103 (a) over Rankin II, et al, in view of U.S. Patent 5,706,408 (Pryor).

New dependent claims 25 and 26 contain the features of claims 17 and 18 respectively. These are features of preferred embodiments, which are not relied on to establish patentability.

Pryor describes a target based machine and method for aligning a member with an object (see the claims of Pryor). The method is useful for setting up large fixtures and robots and in construction.

However Pryor like Gupta is unrelated to a method of inspecting an object for any purpose, such as determination of defects in the surface of an object. Thus Pryor does not provide the disclosures or suggestions that are lacking in Claridge that are necessary to arrive at the invention claimed in applicants' new method claim 19.

Particularly Pryor does not disclose or suggest a method comprising automatically determining at least one area on said surface of said three-dimensional object to be inspected and at least one other

area that is not to be inspected with an arithmetic logic unit based on design data in the electronic form related to the three-dimensional object. Also Pryor does not disclose or suggest performing an inspection by first taking pictures of the three-dimensional object and then assigning areas to be inspected to parts of the pictures.

Hence the rejection based on Rankin II and Pryor with or without Claridge is not applicable to claims 25 and 26 because they ultimately depend on and include the subject matter of claim 19.

For the aforesaid reasons it is respectfully submitted that new claims 25 and 26 should not be rejected as obvious under 35 U.S.C. § 103 (a) over Rankin II, et al, in view of WO 87/00629, Claridge, and further in view of U.S. Patent 5,706,408 (Pryor).

### **III. Rejections of Method Claims 1 to 10**

Claims 1 to 3, 6, and 8 to 9 were rejected as **anticipated** under 35 U.S.C. § 102 (b) by US Published Patent Application 2002/0169586 of Rankin II, et al.

Claims 4 to 5 and 10 were rejected as **obvious** under 35 U.S.C. § 103 (a) over Rankin II, et al, in view of US Patent 6,167,151, issued to Albeck, et al.

Claim 7 was rejected as **obvious** under 35 U.S.C. § 103 (a) over Rankin II, et al, in view of US Published Patent Application 2002/0141645 of Rajagopal, et al.

These three rejections have been obviated by the cancellation of claims 1 to 10 for a method of planning an inspection path. No new claims limited to a method of planning an inspection path have been filed.

Since the sole new independent method claim 19 includes the features of claims 11 and 12, it is respectfully submitted that new claims 19 to 37 should not be rejected as anticipated under 35 U.S.C. § 102 (b) by US Published Patent Application 2002/0169586 of Rankin II, et al, or as obvious under 35 U.S.C. § 103 (a) over Rankin II, et al, in view of US Patent 6,167,151, issued to Albeck, et al, or US Published Patent Application 2002/0141645 of Rajagopal, et al.

#### **IV. CANADIAN PATENT HAS ISSUED WITH CLAIMS CONTAINING SUBSTANTIALLY THE SAME SUBJECT MATTER AS THE ABOVE CLAIMS 19 TO 37**

CA 2,554,641 has issued from the Canadian National Stage application based on PCT/EP 2005/001311. Claims 19 to 37 above contain the subject matter from claims 1 to 19 respectively of the issued Canadian Patent. The applicants were familiar with the content of the

Claridge WO reference from the parallel German Application procedure.

Should the Examiner require or consider it advisable that the specification, claims and/or drawing be further amended or corrected in formal respects to put this case in condition for final allowance, then it is requested that such amendments or corrections be carried out by Examiner's amendment and the case passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing the case to allowance the Examiner is invited to telephone the undersigned at 1-631-549-4700.

In view of the foregoing, favorable allowance is respectfully solicited.

Respectfully submitted,

  
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